

REMARKS

This application has been carefully reviewed in light of the Office Action dated March 30, 2005. Claims 1, 19 to 24, 26 to 28, 32 and 33 are in the application, of which Claim 1 is the only independent claim. Reconsideration and further examination are respectfully requested.

As an initial matter, Applicants note that the Office Action was responsive to proposed claim language submitted in our letter of September 12, 2005, rather than the current claim language submitted in our Amendment of June 30, 2005. The amendments to the claims herein are shown as changes to the claim language entered in the June 30, 2005 Amendment, rather than as changes to the proposed claim language.

Claims 1, 19 to 24, 26 to 28, 32 and 33 were rejected under 35 U.S.C. § 103(a) over JP 11-151233 (Nonaka) in view of U.S. Patent Application Publication 2005/0062865 (Shibazaki). Reconsideration and withdrawal of these rejections are respectfully requested.

Applicants note that the Office Action makes its rejections over JP 11-151233 (Nonaka), but actually cites portions of U.S. Patent Application Publication 2002/0050568 (Nonaka) in its comments. In this regard, it appears that the Japanese Nonaka is a publication of JP 9-319866, from which the U.S. Nonaka Application claims priority. It is Applicants' position that neither JP 11-151233 nor the U.S. Nonaka Publication disclose the features of the present invention. However, for purposes of convenience, Applicants will respond to the portions of the U.S. Nonaka Publication cited by the Office Action.

The present invention generally concerns image sensing using radiation.

Among its many features, the present invention includes (i) transmitting an exposure

permission signal to a radiation generating apparatus after initializing a plurality of image pick up elements by setting a signal line to a reference potential, and controlling a first power source and a second power source to drive a preamplifier after transmission of the exposure permission signal, and (ii) stopping the power supply from the second power source after reading out the electrical signals from the image pick up element.

Referring specifically to claim language, independent Claim 1 as amended is directed to an image sensing apparatus. The apparatus includes a radiation generating apparatus adapted to generate radiation, a sensor comprising a plurality of image pick up elements for converting radiation to electrical signals, a signal line adapted to read out the electrical signals from the image pick up elements, and a preamplifier adapted to amplify the electrical signals read out from the image pickup elements through the signal line. The apparatus also includes a first power source adapted to set the signal line to a reference potential so as to set the image pick up elements to an initialized state, and a second power source adapted to supply electrical power to the preamplifier. Additionally, the apparatus includes a control circuit adapted to transmit an exposure permission signal to the radiation generating apparatus after initializing the plurality of image pick up elements, and to control the first power source and the second power source to drive the preamplifier after transmission of the exposure permission signal. The control circuit stops the power supply from the second power source after reading out the electrical signals from the image pick up element.

In contrast, Applicants submit that the applied art is not seen to disclose or suggest at least the features of (i) transmitting an exposure permission signal to the radiation generating apparatus after initializing the plurality of image pick up elements by setting a signal line to a reference potential, and controlling a first power source and a

second power source to drive the preamplifier after transmission of the exposure permission signal, and (ii) stopping the power supply from the second power source after reading out the electrical signals from the image pick up element.

As understood by Applicants, Nonaka discloses an apparatus for obtaining a radiation image of an object which includes a radiation image sensing unit having a plurality of photoelectric conversion elements arranged in a matrix manner, and a sensor for detecting irradiation of radiation. The apparatus also includes a determining system for determining an irradiation state of radiation on the basis of output from the sensor, and a controlling system for controlling the start and end of an image sensing state on the basis of the determination. (See Nonaka, Abstract).

Page 3 of the Office Action concedes that Nonaka does not explicitly disclose a first power source adapted to set a signal line to a reference potential so as to set the image pick up elements to an initialized state, a second power source adapted to supply electrical power to the preamplifier, a control circuit adapted to cause the first power source to set the signal line to the reference potential before the radiation generating apparatus irradiates radiation, and to cause the second power source to supply electrical power to the preamplifier after the radiation generating apparatus irradiates radiation, wherein the control circuit is further adapted to determine whether a further image sensing is to be carried out, and based on the determination, both of the first power source and the second power source are stopped or only the second power source is stopped, wherein the control circuit makes the determination after reading out the electrical signals from the image pickup elements.

Applicants submit that Nonaka additionally fails to disclose (i) transmitting an exposure permission signal to the radiation generating apparatus after initializing the

plurality of image pick up elements by setting a signal line to a reference potential, and controlling a first power source and a second power source to drive the preamplifier after transmission of the exposure permission signal, and (ii) stopping the power supply from the second power source after reading out the electrical signals from the image pick up element.

In particular, Nonaka discloses that an operator presses an irradiation button, which causes an image sensing request to be sent to the drive control unit. When receiving the image sensing request signal, the drive control unit causes the radiation image sensing unit to perform refreshing and dummy read for a predetermined number of times, and switches the radiation image sensing unit to the image sensing state. (See Nonaka, paragraph 53, lines 4 to 13). The drive control unit then transmits an image sensing preparation completion signal to the radiation control unit, which receives the signal and causes the radiation source to emit the radiation. (See Nonaka, paragraph 53, lines 14 to 19).

However, Applicants respectfully submit that the process recited above does not disclose or suggest the claimed feature of transmitting an exposure permission signal to the radiation generating apparatus after initializing the plurality of image pick up elements by setting a signal line to a reference potential, and controlling a first power source and a second power source to drive the preamplifier after transmission of the exposure permission signal. In particular, refreshing and dummy read operations are not seen to disclose setting a signal line to a reference potential so as to bring the image pick up elements to an initialized state. Moreover, Nonaka fails to disclose a separate or second power source at all, much less one controlled to drive the preamplifier after transmission of

the exposure permission signal. The cited text simply describes that the functions begin when the button is pressed. (See Nonaka, paragraph 53).

Furthermore, Nonaka is not understood to disclose or suggest stopping the power supply from the second power source after reading out the electrical signals from the image pick up element. Specifically, Nonaka discloses that shutdown of the detection process is done according to either a predetermined timing or detected accumulation of radiation, rather than reading signals from the image pick up elements. (See Nonaka, paragraph 53). In addition, as noted above, Nonaka is not seen to disclose a second power supply at all.

Shibazaki is not seen to remedy the above-noted deficiencies of Nonaka. As understood by Applicants, Shibazaki discloses an image capturing apparatus that includes a plurality of photoelectric conversion elements two-dimensionally arrayed, a charge transfer circuit that transfers electrical charges from the photoelectric conversion elements, and an amplifier that is connected to an end of the charge transfer circuit along the direction of charge transfer that converts electrical charge into voltage and amplifies the voltage. At least the photoelectric conversion elements, the charge transfer circuit and the amplifier are provided on a single semiconductor substrate. The apparatus further includes an amplifier power control circuit that controls power to the amplifier in conformance to a control signal provided from outside. (See Shibazaki, Abstract).

Initially, Applicants note that Shibazaki could not possibly teach the first-mentioned feature of the present invention, that is transmitting an exposure permission signal to the radiation generating apparatus after initializing the plurality of image pick up elements by setting a signal line to a reference potential, and controlling a first power source and a second power source to drive the preamplifier after transmission of the

exposure permission signal. Shibazaki teaches an image-capturing device such as an electronic camera, rather than a radiation generating apparatus, much less one that transmitting an exposure permission signal to the apparatus after initializing a plurality of image pick up elements.

Moreover, Shibazaki additionally fails to teach the feature of stopping the power supply from the second power source after reading out the electrical signals from the image pick up element.

In particular, Shibazaki teaches that when a shutter release button is pressed all the way down and a release switch is turned on, power from a positive source and a negative source are supplied to an output amplifier in the image-capturing device and also power is supplied to the photoelectric conversion elements and the charge transfer elements. (See Shibazaki, paragraph 50).

The Office action asserts on page 4 that the shutter timing of Shibazaki (as shown in Figure 3) reads on a control circuit adapted to determine whether further image sensing is to be carried out and thus whether the image capturing power source and amplifier are stopped.

Applicant respectfully submits that this interpretation is incorrect. Figure 3 clearly shows a time chart for a *single* image-capturing operation. (See Shibazaki, Figure 3 and paragraphs 53 to 56). Thus, no determination is made regarding further image sensing, as once the shutter button is fully pressed, the picture is taken and the power source and amplifier are subsequently automatically shut down. (See Shibazaki, paragraphs 54 to 56).

Moreover, even accepting the Office Action's interpretation of Shibazaki, the reference still fails to teach the features of the present invention. Shibazaki is not seen to disclose shutting down the power supply to a second power source after reading out

electrical signals from the image pick up element, as the power supply to the amplifier ends on its own soon after the shutter closes, rather than reading out any electrical signals from the image pick up elements. (See Shibazaki, paragraphs 54 to 56).

Applicants additionally submit that even if the Office's understanding of the above references were accepted as correct, there is nothing in Applicant's view which would have suggested to combine Nonaka and Shibazaki to obtain the features of the present invention such as (i) transmitting an exposure permission signal to the radiation generating apparatus after initializing the plurality of image pick up elements by setting a signal line to a reference potential, and controlling a first power source and a second power source to drive the preamplifier after transmission of the exposure permission signal, and (ii) stopping the power supply from the second power source after reading out the electrical signals from the image pick up element.

In light of the deficiencies of the applied art as discussed above, Applicants submit that independent Claim 1 is in condition for allowance and respectfully request same.

In addition, the other claims in the application are each dependent from the independent claims discussed above and are therefore believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

Accordingly, based on the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office by telephone at (714) 540-8700. All correspondence should be directed to our address given below.

Respectfully submitted,



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